

## BOOK NOTICE

*Fleas of Western North America. Their Relation to the Public Health.* By Clarence Andresen Hubbard. The Iowa State College Press, Ames, Iowa, 1947.  $9\frac{1}{4} \times 6\frac{1}{4}$  in. ix + 533 p. illus. \$6.00.

In 1940, the Iowa State College Press did a service to entomologists by publishing "Fleas of Eastern United States" by Irving Fox. This service has now been expanded greatly by their present publication, which covers 236 species and subspecies of western fleas. The first chapter is an interesting one about the early and present day siphonapterists (with photographs) and their research contributions to the subject. Chapter 2 deals with the medical importance of fleas in connection with bubonic plague and typhus and also with fleas as household and farm pests. Detailed directions for field collecting and laboratory technique appear in chapter 3. The anatomy of the flea in relation to its taxonomy occupies chapter 4. These four chapters make up part I of the volume. Part II, which occupies 331 pages, covers the systematic classification of 236 species and subspecies and includes keys to the families, genera and species. Diagnostic characters are given for each genus and for each species together with information on the range of the species, hosts, medical importance and records of distribution. This part is abundantly supplied with drawings of anatomical details to facilitate identification.

Part III of 120 pages is an extensive, annotated host index which includes much useful information about the habits and ranges of the hosts and the best ways to take them. The balance of the volume is occupied by a bibliography, a synonymic index, a rapid index to western fleas, a flea index according to authors and a general index. At the end of part II there is a geographical index of both western and eastern fleas, which shows clearly where future flea research is needed.

This book is a clear, well written, satisfying work on the western species. The future student, western or eastern, now has before him a relatively easy approach to the subject, due to the knowledge and research of Doctor Hubbard not only on fleas but on their hosts as well and on all ramifications of the subject. The author has produced a gratifying and excellent piece of work.—H. B. W.